

ART. XII.—*Indigenous Fibrous Plants.* By F. A. CORBETT,
Esq.

[Read before the Royal Society, December 17th, 1860.]

IN the report from the Exploring Expedition under the command of Mr. Burke, dated 30th October, 1860, we are informed that the mallow grows in remarkable luxuriance in the barren country beyond the Darling. Mr. Wills, the astronomer and surveyor of the party, says, "It clothes the banks of Wonaminta Creek, and grows to an immense size on nearly all the creeks out here." This statement has suggested to me the submission to the meeting of specimens of oakum and rope made of the fibres of the mallow, also of specimens of paper, oakum and rope manufactured from another indigenous plant, which, it will be observed, is a description of rush or flag. At any time it would be interesting to contemplate the possibility of a tract of the interior of this continent, at present little better than a desert, possessing valuable natural resources in the way of vegetable production, but it is peculiarly so at the present moment, when an inquiry relative to our indigenous fibrous substances is being conducted by a committee of this Society at the instance of the Imperial Government.

The fibrous properties of the mallow, as well as those of the *Lepidosperma gladiata*, the other plant alluded to, were first made known to Europeans by Mr. Alexander Tolmer, of Adelaide. It appeared, however, in the course of some discussions which took place in the Legislative Council of South Australia, on an application made for leave to bring in a Bill to secure to that gentleman a patent right in his discovery, that the aborigines were acquainted with some of the useful properties of these plants. They were, in fact, used by them in making baskets and fishing-lines, and, on this account, it seems that a select committee, to whom the matter was referred, could not agree to recommend the grant to Mr. Tolmer of the exclusive right of using, manufacturing, and exporting these plants. The justice of this refusal has been questioned by the friends of Mr. Tolmer, who hold that a discovery was undoubtedly made by him, inasmuch as he went beyond the blacks in the application of the properties of the plants, and in ascertaining by experiment their fitness for the manufacture of paper, pasteboard, papier mache, oakum and rope, all articles of great commercial importance.

Before exhibiting these specimens to the Society, I thought it proper to bring them under the notice of our eminent botanist, Dr. Mueller, more especially with the view of ascertaining whether there existed in these colonies an indigenous plant resembling, yet differing from, the common English marsh-mallow, or whether the plant in question was identical with that growing about Melbourne, because it would be a very singular fact if valuable properties, existing in a plant so familiar to the scientific men of Europe, remained altogether undiscovered. Moreover, it seemed to me that, if the plant experimented on by Mr. Tolmer were identical with the European, grave doubts might be entertained as to the value of his discovery. Unfortunately, in consequence of my not being in a position to submit a leaf of the plant, a positive statement could not be hazarded by Dr. Mueller, but it is almost sufficient to be able to state that he has little doubt of its being the *Lavatera plebeja*, a native plant, extending from South Australia, through Victoria, into New South Wales, and resembling the genuine English marsh-mallow. The latter, it appears, has not yet immigrated into Australia, the plant usually found here being the British dwarf mallow.

Dr. Mueller also informs me that the *Lavatera plebeja* is perennial, and may be obtained in considerable quantity along the Murray and many of its tributaries, being besides scattered over other parts of the colony. A perennial plant, it may be observed, provided its growth is rapid, and admits of a large crop being annually removed, appears to have its relative advantages in a country possessing abundance of land, and where tillage will in all probability be costly for a long period to come. Moreover, the luxuriant growth of the mallow in tracts of country which appear to be comparatively useless for other purposes, but which nevertheless possess the advantage of being adjacent to our greatest navigable rivers, ought to be an inducement to test its value, directing special attention to the quality and quantity of fibre of a year's growth, investigating the cultivable qualities of the plant and its action on the soil; also ascertaining how far the exhaustion occasioned by annual cropping may be supplied by inundations or other available means of restoration. These are important considerations; for articles of which the consumption is great, such as paper and rope, cannot be sufficiently and uniformly supplied by the spontaneous action of nature; neither could a shrub, or a tree, which takes a long

time to arrive at maturity, yielding a small supply of material in proportion to the area under plantation, ever fully answer our requirements in the way of fibrous substances.

As regards the preparation of the mallow for use, Mr. Tolmer thus describes his process:—"The *Hibiscus* (erroneously so called by him) may be pulled up by the roots, and hung up in bundles to dry. When sufficiently dry, I cut them up in a suitable machine—an ordinary chaff-cutting machine will answer the purpose. They are then to be boiled in a diluted solution of caustic alkali, and afterwards bleached by chloride of lime, or any of the well known processes. It is of importance that the gummy matter should be extracted. The material will now be in a fit state to be manufactured into paper, and I would remark that the manufacture of paper will now be carried on as if the paper were being made of rags. In using it for other purposes (oakum, rope, &c.), the system ordinarily adopted will be applied."

Respecting the *Lepidosperma gladiata*, we are furnished with more positive information. A manufacturer in England who has tried its paper-making qualities, reports that there is no doubt whatever of its making good paper, adding, however, that the price, exact loss of weight, &c., can only be determined by a continuous working of some quantity. As the nearest calculation he could form from the experience of one trial, he estimates the cost of chemicals to make one ton of paper at £3 10s., and fuel £1 10s., English prices. He further adds that half the rush is waste. Referring to the exportation of the plant to England, supposing it not to be divested of its gummy matter, he recommends it to be cut in short lengths, half an inch or three or four inches long, in order to its being packed closely for the purpose of diminishing the freight; or, in order to avoid the expense of bags or canvas covers, he advises to cut, lay the flag, and bind it up very closely in bundles or sheaves like wheat.

As to manufacturing in the colonies, he states that the supply of material and the power of the mill should be equal to produce six tons of paper per week, as the same number of hands would be necessary to make three as six tons, and the cost of apparatus the same, without much difference in other things. The estimated cost, in England, of delivering the manufactured paper at market, embracing every expense, including duty, making, carriage, fuel, and chemicals, dating the calculation from the deposit of the raw material in the mill, would be £25 per ton of paper, the value of which would

be from £50 to £60. This leaves a margin for all expenses attendant on providing the raw material, moving it from the place of its growth in Australia to the mill in England, together with all charges and profits thereon, of £25 at least, on the quantity required for the manufacture of one ton of paper; or, half being reckoned as waste, makes the value of one ton of the plant at the mill in England, £12 10s.

The *Lepidosperma gladiata* grows in great abundance on the coasts of New Holland and Tasmania, and is of that character that it may be cut down annually, and will spring year after year from the same roots. With reference to this, Mr. Tolmer says—"I cut the plant away from the bottom of the stem, without injury to the root, leaving that to shoot out again." And, as regards his mode of dealing with the rush so cut away, he adds—"It is allowed to remain on the ground ten or fifteen days, exposed to the action of the night dews, and to the hot sun in the day, occasionally being turned over; and by this exposure the plant will become partially bleached."

Turning to economical considerations, it may be observed that, even if these plants can be produced here at a low cost, their great bulk is undoubtedly a serious drawback on their exportation to Europe, but that, on the other hand, this very circumstance offers an inducement—a natural protection—to the manufacture of the article on the spot. I would further remark that the constantly increasing number of uses to which paper is applied holds out very great encouragement for local manufacture. The invention of bitumenized paper drainage pipes, for which a factory has been erected in Melbourne, is an event which ought to lead to inquiry into the value of our indigenous plants suitable for paper making, inasmuch as there would be a great consumption of any substance which would enable the drainage pipes to be furnished at a reduced price. The agriculturist would benefit by a new object of cultivation, for which there would be ready sale; while success in production would cheapen the means of drainage and irrigation—two of his greatest wants, and each of nearly equal importance in this country.

I may, in conclusion, add that Mr. Tolmer, taking advantage of our legislation, secured a patent for this colony; and it is to be hoped that if it should be proved that these plants are valuable, either for local use or for exportation, the toil, labor, and expenditure of that gentleman may be rewarded.